REMARKS/ARGUMENTS

These remarks are made in response to the Office Action of April 28, 2009 (Office Action). As this response is timely filed within the 3-month shortened statutory period, no fee is believed due. However, the Examiner is expressly authorized to charge any deficiencies to Deposit Account No. 14-1437.

Claim Rejections – 35 USC § 101

Claims 17-20 and 23-24 were rejected under 35 U.S.C. §101 because it was asserted that the claimed invention is directed to non-statutory subject matter.

Applicants submit that a person of ordinary skill in the art would readily appreciate that practicable embodiments of the claimed invention would be conducted with the aid of a computing machine. Such computing machines are commonly understood to have memory. Further, the operations recited in the claims clearly change the state of the underlying data since the cache, register, or other memory on which the data is stored must be transformed to have a different magnetic polarity, electrical charge, or the like depending on the technology that is used. These are real physical changes. Further, memory is a real physical article. As such, Applicants submit that the method claims perform a transformation under the "machine or transformation" test and thus qualify as patent-eligible subject matter.

In addition, Claim 17 has been amended to positively recite another statutory category such as a memory within the body of the claim and Claims 23-24 have been cancelled in order to facilitate prosecution of the instant application.

Claim Objections

Claims 17, 22, and 23 were objected to due to informalities.

Appropriate correction has been made.

Claim Rejections – 35 USC § 103

Claims 17-20 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent 4,873,634 to Frisch, *et al.* (hereinafter Frisch) in view of U.S. Patent 5,754,972 to Baker, *et al.* (hereinafter Baker), and further in view of Applicants' admitted prior art, and further in view of non-patent literature reference, "Korean Large Vocabulary Continuous Speech Recognition with Morpheme-Based Recognition Units" to Kwon, *et al.* (hereinafter Kwon). Claim 22 was rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent 5,225,981 to Yokogawa (hereinafter Yokogawa) in view of Baker, and further in view of Applicants' admitted prior art and Kwon. Claims 23 and 24 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Yokogawa.

Although Applicants respectfully disagree with the rejections, Applicants have not amended Claim 17 in an effort to even more clearly define the present invention and to facilitate prosecution of the instant application. Applicants have also added Claims 26-27. The claim amendments and the added claims are fully supported by the original disclosure and no new matter has been introduced.

Aspects of Applicants' Invention

It may be helpful to reiterate certain aspects of Applicants' invention prior to addressing the cited references. One embodiment of the invention, as typified by Claim 17, is a method of performing morphological analysis on a natural language text string using a computer having a memory.

The method can include selecting whether or not to decompose a decomposable complex word in response to a request from a natural language processing application that utilizes a morphological analysis result; receiving the natural language text string to be processed, wherein the text string is in an agglutinative language and comprises more

than one complex word, wherein each complex word comprises a linguistic unit having a semantic meaning; decomposing the received text string into tokens and storing the tokens in a work area of a memory of the computer; when it is selected not to decompose a decomposable complex word, determining whether each token is decomposable; if a token is not decomposable, registering the non-decomposable token on a token list stored in a given area of the memory; generating token strings based on the token list and storing the token strings in the work area of the memory; selecting optimum token strings from the generated token strings; and outputting the selected optimum token strings to the natural language processing application for further processing.

See, e.g., Specification, paragraphs [0020] and [0055] to [0064]; see also Fig. 6.

The Claims Define Over The Prior Art

In the morphological analysis method of the present invention, whether or not to decompose the complex word is selected based upon a request from the application making use of the result of morphological analysis. For example, in the context of document retrieval or text mining, it often may be favorable to decompose the complex word minutely so as to detect (hit) as many relevant items as possible. On the other hand, in machine translation, it often may be favorable to deal with the complex word directly without decomposing it, because the meaning of the complex word is changed by decomposing it. Accordingly, the decomposition of the complex word in the morphological analysis is performed selectively (based on the optional settings of the application) upon a request from the application. See paragraph [0044] of the Specification.

In the morphological analysis method of the present invention, when the morphological analysis is performed with the setting of decomposing the decomposable complex word, the number of combinations (paths) to be processed is smaller than in the

conventional morphological analysis, because any unnecessary complex word(s) are removed from the token list at the stage of generating the token list. Accordingly, the process of token string selection is made faster. See paragraph [0071] of the Specification.

Also, in the conventional morphological analysis engine, when the morphological analysis was performed with the setting of decomposing the decomposable complex word, the matching of the token string selected by the token string selecting step with the complex word in the dictionary was performed, and the decomposable complex word included in the token string was decomposed. Therefore, the used amount of storage device (resource) such as memory or hard disk was increased by the amount of the complex word dictionary, and it took excess time to decompose the complex word in executing the morphological analysis process. See paragraph [0072] of the Specification.

On the contrary, in the morphological analysis method of the present invention, when morphological analysis is performed with the setting of decomposing the decomposable complex word, none of the tokens of the complex word are registered on the token list, whereby there is no need for preparing the complex word dictionary in addition to the master dictionary, reducing the used amount of storage device (resource). In executing the morphological analysis process, since there is no need for decomposing the complex word, as well as generating the token list and selecting the token list, it takes a shorter time to perform the process. See paragraph [0073] of the Specification.

Moreover, the conventional morphological analysis method decomposes the decomposable complex word, after selecting the optimum token string, whereby the optimum token string is obtained when the complex word is directly dealt with as itself, and the token string is not assured to be optimum in a state where the complex word is decomposed. On the contrary, in the morphological analysis method of the present invention, when the morphological analysis is performed with the setting of decomposing

the decomposable complex word, the generated token list does not contain the tokens of the complex word, whereby the token string containing the tokens of the complex word is not to be processed. Accordingly, it is assured that the token string selected by the token string selecting process by no means contains the tokens of the complex word, and is optimum. See paragraphs [0074]-[0075] of the Specification.

Frisch describes a technique to provide correctly spelled candidates for misspelled compound words ("Spelling Aid"). The technique consists of identifying substrings of the compound word whose components satisfy specific positional characteristics and then providing correctly spelled candidates for any unrecognized substrings occurring before, between, or after the previously identified substrings. As a final step, these candidate words are combined with the recognized substrings to obtain valid compound words where every component has the positional characteristic required by its position in the compound word. Morphological characteristics of the language are considered. See col. 3, lines 41-53.

Clearly, the subject matter of Frisch, which concerns providing correctly spelled candidates for misspelled compound words, has nothing to do with the subject matter of the present invention, which concerns a novel method for performing morphological analysis on a natural language text string in which only non-decomposable tokens are registered on a token list.

In addition, it is noted that the compound word of Frisch is not a text string in the sense of the present invention because in the present invention the text string contains more than one complex or compound word. It is also noted that columns 4-5, lines 40-67, 1-51 of Frisch describes the process of obtaining tokens from a compound word, but not a process of determining whether each token is decomposable.

It was stated in the Office Action that Frisch fails to teach selecting whether or not to decompose a decomposable complex word in response to a request from an application

that utilizes a morphological analysis result, but Baker teaches this feature (Baker, columns 5-6, lines 63-67, 1-5, Baker teaches the user of user input to determine when to decompose a compound (complex) word for an application in speech recognition) and if a token is not decomposable, registering the non-decomposable token on a token list (Baker, column 9, lines 51-67, ... generates a candidate list 114 and displays that list 116, in response to the characters and formatives entered by the user...).

Columns 5-6, lines 63-67, 1-5 of Baker disclose an apparatus and a method for recognizing compound words from an utterance containing a succession of one or more words from a predetermined vocabulary. At least one of the words in the succession is a compound word including at least two formatives in succession. The formatives are words in the vocabulary. The apparatus includes a user controlled element for generating a signal representative of a compound word, wherein the signal corresponds to selected ones of the formatives uttered in succession.

It is not clear how the above passage has anything to do with selecting whether or not to decompose a decomposable complex word in response to a request from an application that utilizes a morphological analysis result, as in the present invention. As already discussed above, in the context of document retrieval or text mining, it often may be favorable to decompose the complex word minutely so as to detect (hit) as many relevant items as possible; whereas in machine translation, it often may be favorable to deal with the complex word directly without decomposing it, because the meaning of the complex word is changed by decomposing it. Accordingly, the decomposition of the complex word in the morphological analysis according to the present invention is performed selectively (based on the optional settings of the application) upon a request from the application. In addition, since in Baker there is only one application (speech recognition), it is not possible for Baker to select whether or not to decompose a decomposable complex word in response to a request from an application (text retrieval,

text mining, or machine translation) that utilizes a morphological analysis result.

It is also not clear how generating a candidate list 114 and displaying that list 116 by the compound word recognizer 12, in response to the characters and formatives entered by the user (Baker, column 9, lines 51-67) have anything to do with determining whether each token is decomposable and if a token is not decomposable, registering the non-decomposable token on a token list. It is noted that the compound word recognizer recognizes compound words which are clearly decomposable.

The other cited references do not make up for the deficiencies of Frisch and Baker as discussed above.

Finally, it was asserted in paragraph 4 on page 3 of the Office Action that it is noted that the features upon which applicant relies (i.e., wherein the text string is in an agglutinative language and comprises more than one compound word, wherein each compound word comprises a linguistic unit having a semantic meaning (Remarks, pages 7-9)) are not recited in the rejected claim(s). However, this feature was clearly recited in Claim 17 as amended in the previous response.

Accordingly, the cited references, alone or in combination, fails to disclose or suggest each and every element of Claims 1 and 26-27. Applicants therefore respectfully submit that Claims 1 and 26-27 define over the prior art. Furthermore, as each of the remaining claims depends from Claim 1 while reciting additional features, Applicants further respectfully submit that the remaining claims likewise define over the prior art.

Applicants thus respectfully request that the claim rejections under 35 U.S.C. § 103 be withdrawn.

CONCLUSION

Applicants believe that this application is now in full condition for allowance, which action is respectfully requested. Applicants request that the Examiner call the undersigned if clarification is needed on any matter within this Amendment, or if the Examiner believes a telephone interview would expedite the prosecution of the subject application to completion.

Respectfully submitted,

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